

REMARKS

Claims 1-18 are pending herein.

By this Amendment, claims 1, 2 and 4 have been amended to further address the rejection of the claims under 35 U.S.C. § 112, second paragraph as discussed more fully below.

No new matter is added by this Amendment. Support for the amendment to claims 1, 2 and 4 is found in the original specification, claims and Figures. In particular, support for the language added to the claims may be found at, for example, the paragraph at page 22, line 23 through page 23, line 7, in the original specification.

Applicants appreciate the courtesies shown to Applicants' representative by Examiner Phinney and Examiner Santiago in the August 26, 2003 interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

I. Rejection under 35 U.S.C. § 112, Second Paragraph

Claims 1, 2 and 4 were rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite. Specifically, the Patent Office alleged that claims 1, 2 and 4 are indefinite because the phrase "wherein light generated in the light-emitting layer is emitted by inhibiting spontaneous emission in two dimensions" allegedly seems to imply that inhibiting emission is the mechanism for causing the emission.

In the Amendment filed on August 20, 2003, claims 1, 2 and 4 were amended to remove the term "emitted" and replace this term with "controlled." However, during the August 26 interview, the Patent Office indicated that the amendment to claim 4 is insufficient to show how light is controlled such that spontaneous emission in two dimensions is inhibited. Applicants thus further amend claims 1, 2 and 4 to further clarify that the optical element forms an incomplete photonic band wherein the light is confined by the optical element in one direction or two directions to inhibit spontaneous emission of light in one

dimension or two dimensions, and wherein light generated in the light-emitting layer is controlled by inhibiting spontaneous emission in two dimensions.

Amended claims 1, 2 and 4, as supported by the specification, clearly show how light is controlled such that spontaneous emission in two dimensions is inhibited. See also page 22, line 4 through page 23, line 7 of the specification. Applicants submit that the amended claims are clear and definite in accordance with the requirements of 35 U.S.C. §112, second paragraph.

For the foregoing reasons, reconsideration and withdrawal of this rejection are respectfully requested.

II. Rejection under 35 U.S.C. § 102(b)

Claims 1, 5 and 15-17 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,780,174 (Tokito). This rejection is respectfully traversed.

During the interview on August 26, the Patent Office stated that in the paragraph starting on page 2, line 22 of the specification of the present specification, an incomplete photonic band is explained. The Examiners alleged that according to the specification, an incomplete photonic band is indicated to exist when the difference in the refractive indices between the first medium layer and the second medium layer is small. The Examiners alleged that the term "small," as here used in the specification, does not have any significant meaning.

During the interview, the Patent Office further alleged that the figures of Tokita, specifically Figure 12, illustrate different refractive indices between two layers (i.e., a high-refractive-index compound and a low-refractive-index compound). Thus, the Patent Office concluded that in view of the definition in the specification, Tokita discloses that the optical element forms an incomplete photonic band. Applicants respectfully disagree.

Tokito teaches, in particular with respect to Fig. 12, "a low-refractive-index compound and a high-refractive-index compound are alternately stacked on the transparent

substrate 10, and a transparent conductive compound is deposited on the final deposited low-refractive-index compound." See col. 9, lines 10-14. Here, Tokito teaches away from a small difference in the refractive indices between the first medium layer and the second medium layer by disclosing a high-refractive-index compound deposited on a low-refractive-index compound.

Thus, it can not be concluded that Tokito teaches an optical element that forms an incomplete photonic band wherein light is confined by the optical element in one direction or two directions to inhibit spontaneous emission of light in one dimension or two dimensions and wherein light generated in the light-emitting layer is controlled by inhibiting spontaneous emission in two dimensions, as recited in claim 1.

Moreover, even if the Fig. 12 could somehow be viewed as disclosing an incomplete photonic band, Tokito still would not anticipate the claimed subject matter. Specifically, nowhere does Tokito teach or suggest a light-emitting device wherein light is emitted in more than one direction. More specifically, Tokito fails to disclose light confined in one direction or two directions to inhibit spontaneous emission of light in one dimension or two dimensions, as recited in claim 1.

For the foregoing reasons, Applicants respectfully submit that Tokito fails to anticipate the subject matter of independent claim 1 or any of dependent claims 5 and 15-17. Reconsideration and withdrawal of this rejection are thus respectfully requested.

III. Rejection under 35 U.S.C. § 102(e)

Claims 2 and 12-14 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent No. 6,487,231 (Boucart). This rejection is respectfully traversed.

Claim 2 recites, in part, a light-emitting device comprising a substrate and a light-emitting section, wherein the light-emitting section includes an optical element for causing light generated in the light-emitting layer to be transmitted in a predetermined direction,

wherein the optical element forms an incomplete photonic band and wherein the light is confined by the optical element in one direction or two directions to inhibit spontaneous emission of light in one dimension or two dimensions, and wherein light generated in the light-emitting layer is controlled by inhibiting spontaneous emission in two dimensions.

The Patent Office alleged that Boucart discloses the light-emitting device of claim 2. During the August 26 interview, with respect to the optical element forming an incomplete photonic band, the Patent Office referred to column 5, lines 56-57 of the specification of Boucart as disclosing this limitation, wherein it is stated, that "small available refractive index difference Δn between reflective layers of the Distributed Bragg Reflectors (DBRs) requires that a large number of layers with high composition and thickness precision be used to achieve sufficient reflectivity." See col. 1, lines 53-57 of Boucart.

Here, Boucart is merely discussing problems associated with the prior art. In fact, Boucart teaches away from a small refractive index difference. At column 6, lines 16-20, Boucart discloses that "oxidation of top mirror 12 creates a large refractive index difference between adjacent layers" and that this "index difference can drastically increase the stop bandwidth of top mirror 12, and therefore relax the growth accuracy for top mirror 12." Boucart further discloses at col. 10, lines 3-6, that with "any of the embodiments illustrated in FIGS. 1 through 17 top and bottom mirrors 12 and 14 can be dielectric mirrors" and that "dielectric materials exhibit large index contrast."

Thus, Boucart is clearly teaching away from a small refractive index difference. According to the logic of the Patent Office, Boucart can not teach an incomplete photonic band, as recited in claim 2.

However, even if Boucart somehow did teach an incomplete photonic band, Boucart still would not anticipate the claimed subject matter. Specifically, nowhere does Boucart teach or suggest a light-emitting device wherein light is emitted in more than one direction.

More specifically, Boucart fails to disclose light confined in one direction or two directions to inhibit spontaneous emission of light in one dimension or two dimensions, as recited in claim 2.

For the foregoing reasons, Applicants respectfully submit that Boucart fails to anticipate the subject matter of independent claim 2 or any of dependent claims 12-14. Reconsideration and withdrawal of this rejection are thus respectfully requested.

IV. Allowable Subject Matter

Applicants note with appreciation that claims 3, 6-11 and 18 would be allowable if rewritten in independent form including all the limitations of their respective base claim or any intervening claims.

V. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-18 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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